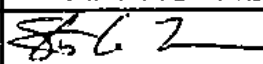
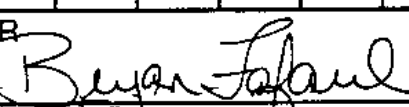




REVISIONS																
SYMBOL	DESCRIPTION										DATE	APPROVAL				
- -	Initial Release										10/20/92					
SHEET REVISION STATUS																
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
REV	- -	- -	- -	- -	- -	- -	- -	- -	- -							
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REV																
ORIGINATOR										DATE		FSC: 4540				
B. Fafaul 										10-19-92		Shunt Dissipator, Dual Plane, Detail Specification for				
APPROVED										DATE						
P. Jones 										10-19-92						
CODE 311 SUPERVISORY APPROVAL										DATE						
R. Chinnapongse 										10/20/92						
OTHER APPROVAL										DATE						
OTHER APPROVAL										DATE		SPEC #: S-311-P-79/09				
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771																
CAGE CODE: 25306											SHEET 1 OF 9					

1.0 SCOPE

- 1.1 Purpose. This specification identifies the detail requirements for S-311-P-79/09 dual plane, dual element, parallel strand, shunt dissipators for use in GSFC space flight applications.
- 1.2 Specifications. The purchase order and GSFC S-311-P-79 shall be considered as part of this document.
- 1.3 Goddard Part Number. Parts procured to this specification shall be identified as noted in Table II.

2.0 APPLICABLE DOCUMENTS

- 2.1 Documents. The following documents, of the issue in effect on the date of invitation for bids, forms a part of this specification to the extent specified herein.

SPECIFICATIONS

GSFC S-311-P-79	Procurement Specification for Thermofoil Heaters
MIL-W-22759/33	Wire, Electric, Fluoropolymer-Insulated, Crosslinked Modified ETFE, Lightweight, Silver-Coated, High-Strength, Copper Alloy, 600-Volt, +200°C

- 2.2 Order of Precedence. For purpose of interpretation the following order of documents shall apply:

- a) Purchase Order or Contract
- b) This Specification (GSFC S-311-P-79/09)
- c) GSFC S-311-P-79

3.0 REQUIREMENTS

3.1 Qualification. Qualification shall be in accordance with paragraph 3.1 of GSFC S-311-P-79.

3.2 Materials. Materials shall be in accordance with paragraph 3.2 of GSFC S-311-P-79, except as modified herein.

3.2.1 Dissipator Materials.

3.2.1.1 Dissipator Element. The dissipator element shall be a single zone, dual plane, dual element, and parallel strand design. Magnetic and inductive effects shall be minimized to the greatest extent possible. To insure this, non-magnetic materials shall be used in accordance with paragraph 3.2.1.2 herein. The foil pattern of each element shall be identical except for minimal shifting of lead wire exit points as required. The intention is to operate the elements simultaneously and cancel inductive effects by running current in opposite directions in each element. The elements shall therefore be registered on top of each other to within one half the width of the foil elements. The elements shall be insulated from each other except for the point where the dual plane feedthrough occurs. The design shall be such that the power density is as specified in paragraph 3.5 herein. The foils shall be uniform in cross-section, unwrinkled and free of cracks, raised spots, or overcuts. Spacing between elements shall be not less than 0.127mm (0.005in).

3.2.1.2 Non-magnetic Dissipator Element. Non-magnetic material shall be required in accordance with paragraph 3.2.1.2 of GSFC S-311-P-79.

- 3.2.1.3 Leads. The leads shall be MIL-W-22759/33-22-XX (XX identifies wire colors to be selected by supplier) wire. The leads shall be 305 ± 5 cm (120 ± 2 in) length and shall exit the dissipator element as indicated in Figure 1. The lead wires shall exit within 6.35mm (0.25in) of each other to facilitate twisting of the leads without introducing uncompensated current loops. The lead wires shall be secured to the dissipator in such a way that lead pull stresses are not transmitted to the weld joint.
- 3.2.1.4 Protective Coating for Enclosure. The dissipator assemblies shall be protected by a coating or enclosure of Pyralux WA which shall completely cover the exterior of the dissipator element, including connection or terminations. The coating shall not crack, craze, drip, run, or delaminate at any temperature up to and including 140°C.
- 3.2.2 Thermal Vacuum Outgassing. All material used in the manufacture of this product shall be in accordance with paragraph 3.2.2 of GSFC S-311-P-79.
- 3.3 Design and Construction. Dissipators shall be of the design, construction, and physical dimensions as specified herein.
- 3.3.1 Exterior Dimensional Tolerance. The length and width of each dissipator shall not vary by more than $\pm 1\%$ of the values specified in Table I herein.
- 3.3.2 Interior Dimensions. Interior dimensions shall be in accordance with paragraph 3.3.2 of GSFC S-311-P-79.
- 3.4 DC Resistance (DCR). The DCR shall be as specified in paragraph 3.4 of GSFC S-311-P-79 and Table II herein.

- 3.5 Power Rating. Dissipators shall have a power rating of 0.23w/cm^2 (1.5w/in^2) for effective element area, based on continuous full-load operation with the dissipator suspended in still air at 25°C . This power rating is dependent on the ability of the dissipators to operate with full-load for 1000 hours and not change in DCR $>\pm 1\%$.
- 3.6 Dielectric Withstanding Voltage (DWV). DWV shall be in accordance with paragraph 3.6 of GSFC S-311-P-79, except that the leakage current between the element and outer surface shall not exceed 1 mA excluding reactive current.
- 3.7 Insulation Resistance. Insulation resistance shall be in accordance with paragraph 3.7 of GSFC S-311-P-79.
- 3.8 Conditioning. Conditioning shall be in accordance with paragraph 3.8 of GSFC S-311-P-79, except that the leakage current between the element and outer surface shall not exceed 1 mA excluding reactive current.
- 3.9 Lead Pull Strength. Lead pull strength requirements shall be in accordance with paragraph 3.9 of GSFC S-311-P-79.
- 3.10 Thermal Shock. Thermal shock requirements shall be in accordance with paragraph 3.10 of GSFC S-311-P-79, except that the maximum temperature shall be 140°C .
- 3.11 Low Temperature Operation. Low temperature operation requirements shall be in accordance with paragraph 3.11 of GSFC S-311-P-79.
- 3.12 Life. Life requirements shall be in accordance with paragraph 3.12 of GSFC S-311-P-79.

3.13 Marking. The dissipators shall be marked in accordance with paragraph 3.13 of GSFC S-311-P-79.

3.14 Workmanship. Workmanship shall be in accordance with paragraph 3.14 of GSFC S-311-P-79.

4.0 QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection. Responsibility for inspection shall be in accordance with paragraph 4.1 of GSFC S-311-P-79.

4.2 Classification of Inspection. Classification of inspections shall be in accordance with paragraph 4.2 of GSFC S-311-P-79.

4.3 Inspection Conditions. Inspection conditions shall be in accordance with paragraph 4.3 of GSFC S-311-P-79.

4.4 Qualification Inspection. Qualification inspections shall be in accordance with paragraph 4.4 of GSFC S-311-P-79.

4.5 Requalification. Requalification shall be in accordance with paragraph 4.5 of GSFC S-311-P-79.

4.6 Quality Conformance Inspection (QCI). QCI shall be in accordance with paragraph 4.6 of GSFC S-311-P-79.

4.7 Methods of Examination and Test.

4.7.1 Visual and Mechanical Examination. Visual and mechanical examination shall be in accordance with paragraph 4.7.1 of GSFC S-311-P-79.

- 4.7.2 Conditioning. Conditioning shall be in accordance with paragraph 4.7.2 of GSFC S-311-P-79.
- 4.7.3 Dielectric Withstanding Voltage (DWV). DWV shall be in accordance with paragraph 4.7.3 of GSFC S-311-P-79.
- 4.7.4 Insulation Resistance (IR). IR shall be in accordance with paragraph 4.7.4 of GSFC S-311-P-79.
- 4.7.5 DC Resistance (DCR). DCR shall be in accordance with paragraph 4.7.5 of GSFC S-311-P-79.
- 4.7.6 Lead Pull Strength. Lead pull strength shall be in accordance with paragraph 4.7.6 of GSFC S-311-P-79.
- 4.7.7 Thermal Shock. Thermal shock shall be in accordance with paragraph 4.7.7 of GSFC S-311-P-79, except the maximum temperature shall be 140°C.
- 4.7.8 Low Temperature Operation. The low temperature operation shall be in accordance with paragraph 4.7.8 of GSFC S-311-P-79.
- 4.7.9 Life. Life testing shall be in accordance with paragraph 4.7.9 of GSFC S-311-P-79.
- 4.7.10 Thermal Vacuum Outgassing. Thermal vacuum outgassing shall be in accordance with paragraph 4.7.10 of GSFC S-311-P-79.

5.0 PREPARATION FOR DELIVERY

- 5.1 Preservation and Packaging. Preservation and packaging shall be in accordance with paragraph 5.1 of GSFC S-311-P-79.

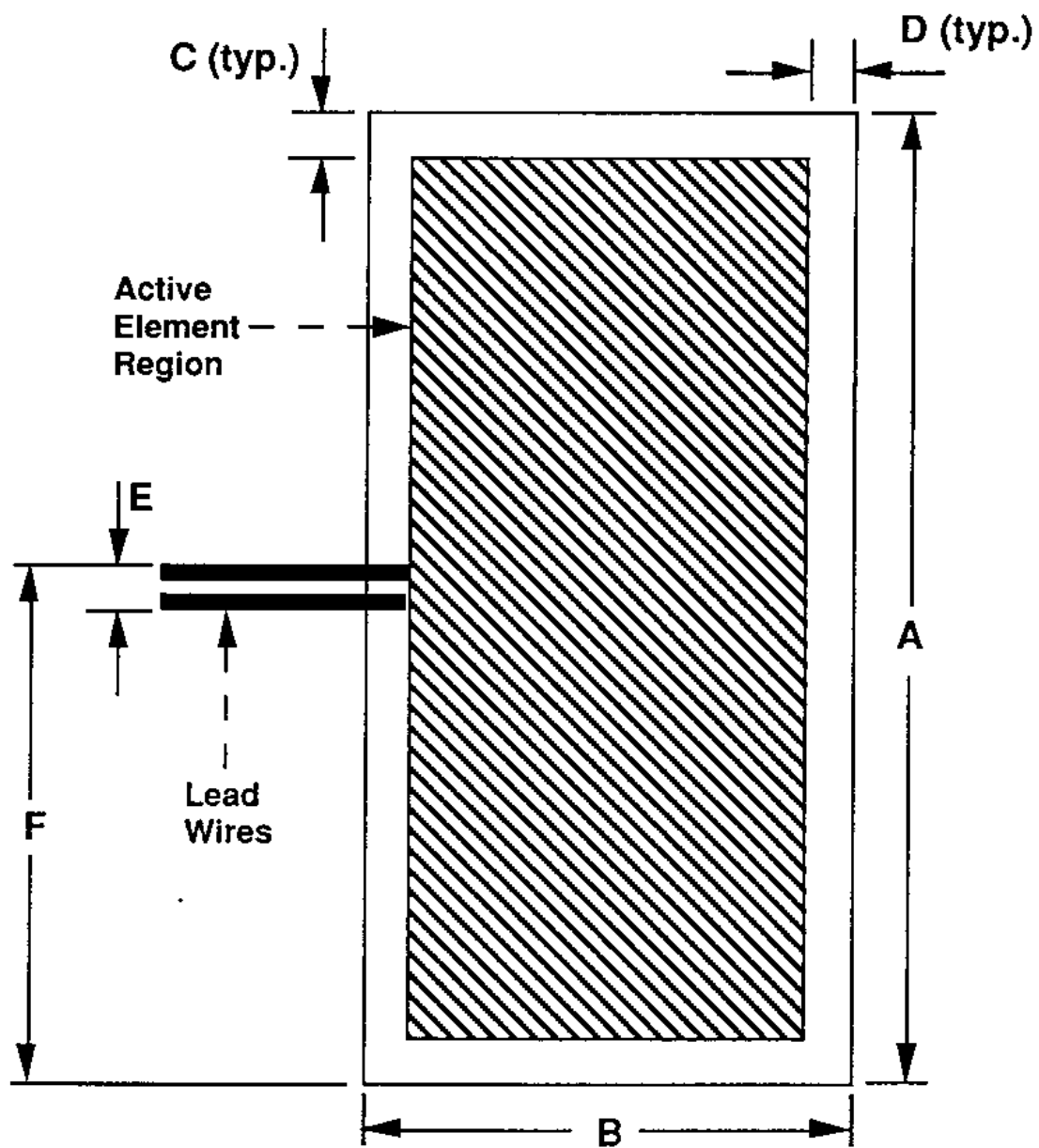
- 5.2 Packaging. Packaging shall be in accordance with paragraph 5.2 of GSFC S-311-P-79.
- 5.3 Marking. Marking shall be in accordance with paragraph 5.3 of GSFC S-311-P-79.

Table I Physical Dimensions

A mm(in)	B mm(in)	C mm(in)	D mm(in)	E mm(in)	F mm(in)
254 (10.0)	127 (5.0)	1.5 (0.060)	1.5 (0.060)	6.35 (0.25)	127 (5.0)

Table II Electrical Characteristics

GSFC Part Number	DC Resistance (DCR)	Max. Voltage	Max. Power Dissipation
S-311-P-79/09-01	48Ω ±5%	35VDC	27W



(see Table I for dimensions)

Figure 1. Physical Dimensions